the staff against explosions while simultaneously presenting a relatively low weight.

The above object is according to the invention obtained by at least one layer of a particle-shaped material being a ceramic material of a density in the range of approximately 0.3 to 1.5 g/cm^3, each of the particles having a pore diameter in the range of approximately 20 to 120 μ and a physical size in the range of 0.5 to 10 mm.

The resulting assembly is relatively light and ensures a comparatively good protection against explosions. The ceramic material in question can be made of AlO_2, MgO and SIO_2 as well as mixtures or compositions thereof. Such a ceramic material turned out to be particularly energy-absorbing due to the fact that the energy of a blast wave resulting from an explosion hits the assembly and is accumulated therein because the ceramic material is caused to move. The latter movement of the ceramic material is caused by the individual particles sliding against one another and presenting such a fragile state that said ceramic material is crushed into a fine powder while being heated. As a result of the latter accumulation of energy and the continued movement of the blast wave into the vehicle in question in combination with the deformation of the remaining structural elements of the vehicle as well as the fact that the vehicle per se is raised or moved, the persons present inside such a vehicle do very likely survive such an explosion. A suitable dimensioning of the assembly in question as well as a suitable selection of wall materials, such as fibre-reinforced rubber material according to the invention, has the effect that the assembly can absorb at least 25% of the total energy optionally hitting such a vehicle.

According to the invention, the ceramic material may advantageously present a crystal size in the range of approximately 1 to approximately 20 μ.

In addition, the ceramic material may according to the invention advantageously present a density in the range of approximately 0.5 to approximately 0.95 g/cm^3, and preferably in the range of 0.6 to 0.8 g/cm^3.

The particles of the ceramic material may according to the invention also advantageously present a pore diameter in the range of approximately 30 to approximately 80 μ, and preferably in the range of approximately 45 to approximately 65 μ.

Finally according to the invention, the particles of the ceramic material may advantageously present a physical extent in the range of approximately 1 to approximately 7 mm, and preferably in the range of approximately 2 to approximately 5 mm.

Brief Description of the Drawing

The invention is explained in detail below with reference to the drawing showing a cross sectional view of an assembly according to the invention.

Best Mode for Carrying out the Invention

The assembly according to the invention shown in the drawing includes three layers, viz. a top outer wall 1 and a bottom outer wall 2 as well as an intermediate layer of ceramic material. The outer layers are made of a fibre-reinforced rubber material, and the intermediate layer includes a ceramic material presenting a density in the range of approximately 0.3 to approximately 1.5 g/cm^3, a pore diameter in the range of approximately 20 to 120 μ and a physical extent in the range of 0.5 to 10 mm. The ceramic material is of a crystal size in the range of approximately 1 to approximately 20 μ, it presents particularly advantageously a density in the range of approximately 0.5 to 0.95 g/cm^3 and preferably in the range of 0.6 to 0.8 g/cm^3, a pore diameter advantageously in the range of approximately 30 to approximately 80 μ and preferably in the range of approximately 45 to approximately 65 μ as well as finally a physical extent advantageously in the range of approximately 1 to approximately 7 mm and preferably in the range of approximately 2 to approximately 5 mm.

The assembly is closed at the sides in such a manner that a flat closed pocket is formed between the outer walls 1 and 2, and the ceramic material is placed in said

Claims

1. An assembly for protection against an explosion, said assembly including a substantially plate-shaped multi-ply element formed by two outer walls (1, 2) and at least one intermediate layer (3) of a particle-shaped material, **characterised in** that at least one layer of a particle-shaped material is a ceramic material presenting a density in the range of approximately 0.3 to 1.5 g/cm^3, each of the particles having a pore diameter in the range of approximately 20 to 120 μ and a physical size in the range of approximately 0.5 to 10 mm.

2. An assembly According to claim 1, **characterised in** that the ceramic material presents a crystal size in the range of approximately 1 to 20 μ.

3. An assembly according to claim 1 or 2, **characterised in** that the ceramic material presents a density in the range of approximately 0.5 to 0.95 g/cm^3 and preferably in the range of approximately 0.6 to 0.8 g/cm^3.

4. An assembly according to claim 1,2 or 3, **characterised in** that the particles of the ceramic material present a pore diameter in the range of approximately 30 to 80 μ and preferably in the range of approximately 45 to 65 μ.

5. An assembly according to claim 1,2, 3 or 4, **characterised in** that the particles of the ceramic material presents a physical size in the range of approximately 1 to 7 mm and preferably in the range of approximately 2 to 5 mm.

6. An assembly according to one or more of the preceding claims 1 to 5, **characterised in** that the outer walls (1, 2) are made of a metal material.

7. An assembly according to one or more of the preceding claims 1 to 6, **characterised in** that the outer walls (1, 2) are made of a fibre-reinforced rubber material.